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Ontario Energy Board



IN THE MATTER OF THE
ONTARIO ENERGY BOARD ACT
AND
IN THE MATTER OF
AN APPLICATION BY

ICG UTILITIES (ONTARIO) LTD

FOR
Authorization to Operate the
Oil Springs East Pool
and for
Leave to Construct a Natural Gas Pipeline

E.B.O. 167
E.B.L.O. 233

DECISION WITH REASONS

Pour des renseignements en français, veuillez communiquer
avec la Commission de l'énergie de l'Ontario.

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(La Commission accepte les appels
à frais virés.)

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ONTARIO ENERGY BOARD

IN THE MATTER OF the Ontario Energy Board Act, R.S.O. 1980, c. 332 as amended, and in particular Sections 20 and 21(1) thereof;

AND IN THE MATTER OF an application by ICG Utilities (Ontario) Ltd for authority to inject gas into, store gas in and remove gas from, a designated gas storage area known as the Oil Springs East Pool and to enter into and upon the land for such purposes.

AND IN THE MATTER OF the Ontario Energy Board Act, R.S.O. 1980, c. 332 as amended, and in particular Sections 46 and 48 thereof;

AND IN THE MATTER OF an application by ICG Utilities (Ontario) Ltd for leave to construct a natural gas pipeline in the Township of Enniskillen in the County of Lambton.

BEFORE: R.M.R. Higgin
Presiding Member

R.D. Walker
Member


February 8, 1990

DECISION WITH REASONS

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1. INTRODUCTION

The Applications

- 1.1 ICG Utilities (Ontario) Ltd ("ICG" or "the Applicant"), on June 5, 1989, requested the Ontario Energy Board ("the Board") under Sections 20 and 21(1) of the Ontario Energy Board Act ("the Act"), to issue an Order authorizing ICG to inject gas into, store gas in, and remove gas from, a proposed designated gas storage area known as the Oil Springs East Pool ("the storage pool" or "the Pool") located in Enniskillen Township in the County of Lambton, and to enter upon the lands in the area for such purposes. This application was given file number E.B.O. 167.
- 1.2 In a related application, ICG applied to the Board under Sections 46 and 48 of the Act for leave to construct a transmission pipeline and

gathering system originating at the Pool and extending to the Union Gas Limited ("Union") Dawn-Trafalgar transmission pipeline, in order to transport natural gas to and from the Pool. This application was given Board file number E.B.L.O. 233.

- 1.3 ICG had simultaneously applied to the Board, under Section 35(2) of the Act, for designation of certain lands overlying the Pool as a gas storage area. A public hearing was held and the Board subsequently submitted its Report, dated December 6, 1989, to the Lieutenant Governor in Council ("Lieutenant Governor") recommending that certain lands in Enniskillen Township, as shown in Figure 1 and more particularly as described in Appendix I, be designated as a gas storage area and included in Regulation 700 made under the Act. Such a designation was made by O. Reg. 690/89, which was published in the Ontario Gazette on December 30, 1990.

- 1.4 Upon designation of these lands as a gas storage area, the Board can proceed under Sections 20 and 21(1) of the Act, to consider ICG's application for authorization to inject gas into, store gas, in and remove gas from, the Pool, and, under Sections 46 and 48 of the Act, to consider the application for leave to

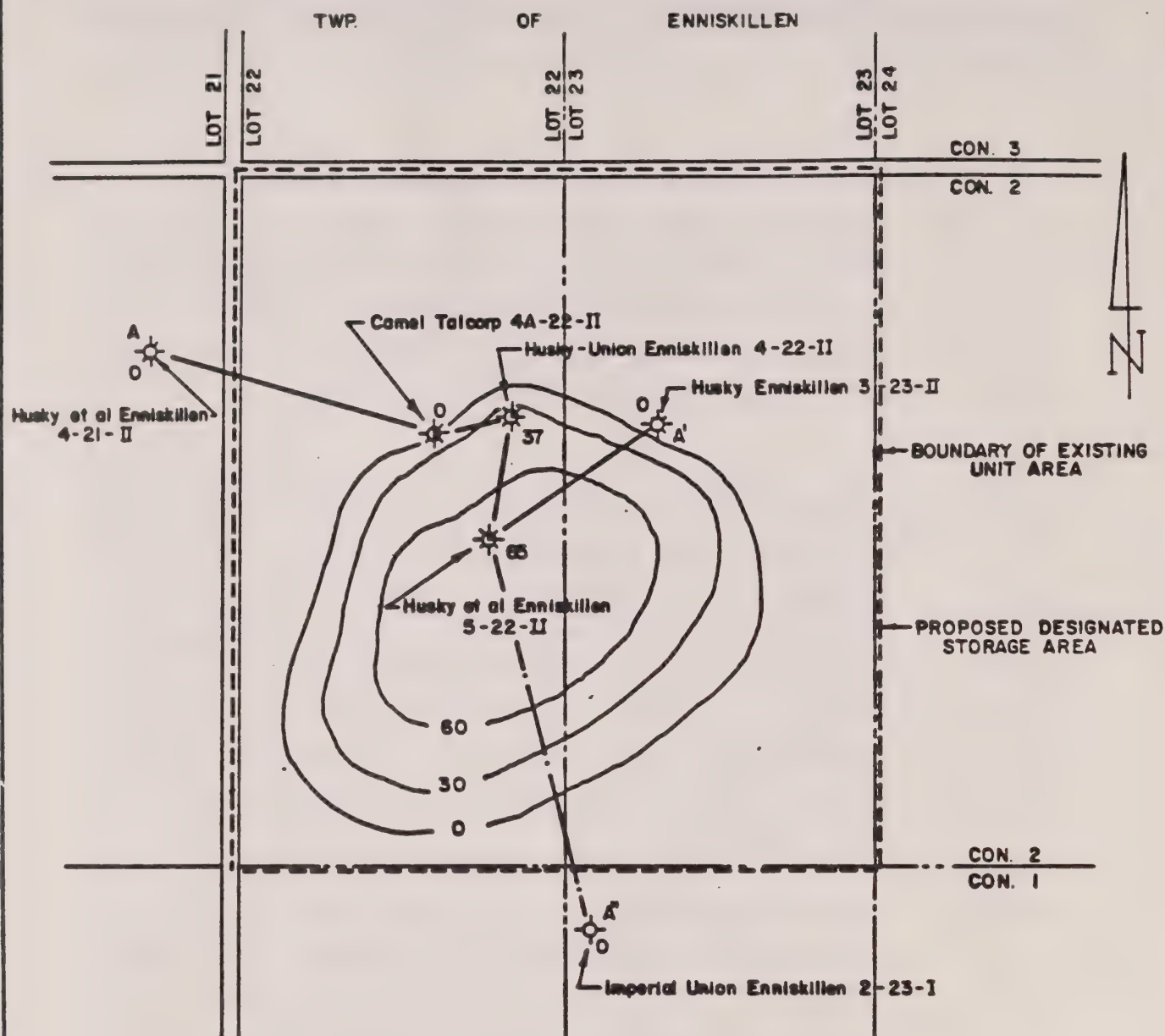
construct the transmission lines and facilities linking the Pool with Union's Dawn-Trafalgar transmission line. Consequently this Decision deals with the merits of ICG's applications to the Board for such authorizations.

1.5 In reviewing applications for authorization to inject, store and remove gas, the Board considers the Applicant's rights to the storage capacity of the pool, the need for the storage provided by the pool, the timing and proposed operation of the pool, the suitability of the pool for the proposed use, the economic viability of the proposal and whether compensation for the surface and mineral rights has been settled.

1.6 In considering applications for leave to construct the related facilities, the Board considers the need for the facilities, land-owner interests, environmental impact, public safety, capital costs and economic viability.

Background

1.7 ICG operates a natural gas distribution system comprising over 6,000 km of pipeline serving over 100 communities in Ontario with 167,000 residential, commercial and industrial customers. It also operates a liquified



LEGEND

- ☼ Gas Producer
- ☼ Gas Show - Abandoned
- ☼ Gas & Oil Show - Abandoned
- ☼ Dry - Abandoned

FIGURE 1

OIL SPRINGS EAST

POOL

ICG UTILITIES (ONTARIO) LTD

SCALE 1 : 12,000

natural gas ("LNG") facility with a storage capacity of about $14.2 \times 10^6 \text{ m}^3$ (0.5 Bcf) which is used to provide winter peak deliverability. Its operations are widespread throughout the province, ranging from Kenora in northwestern Ontario to Cornwall in eastern Ontario.

- 1.8 ICG purchases approximately 80 percent of its natural gas requirement from Western Gas Marketing Limited ("WGML"), a wholly-owned subsidiary of TransCanada PipeLines Limited ("TCPL"). ICG has limited flexibility under its contract with WGML to purchase spot gas for summer injection into the storage pool. The remainder of ICG's supply is provided by its buy-sell contract customers.
- 1.9 All volumes are transported to ICG's receipt points by means of TCPL's transmission system. ICG has concluded a new Storage Transportation Service ("STS") contract with TCPL which will enable it to inject into storage up to $3,000 \times 10^3 \text{ m}^3$ (106 MMCF) per day and remove up to $1,500 \times 10^3 \text{ m}^3$ (53 MMCF) per day.
- 1.10 ICG has also amended its existing STS contract with Union to provide for the movement of these volumes on the Union pipeline system for injection into, and removal from, storage.

- 1.11 Unlike The Consumers' Gas Company Ltd. ("Consumers Gas") and Union, ICG, at present, owns no underground storage facilities. It does, however, by contract, have access to 150,000 $10^3 m^3$ (5.3 Bcf) of long-term storage and 28,000 $10^3 m^3$ (0.99 Bcf) of short-term storage owned and operated by Union and is able to utilize this volume through its existing contracts with Union and TCPL.
- 1.12 Union operates a fully integrated natural gas storage, transmission and distribution system. It has available storage capacity of approximately 3,170 $10^6 m^3$ (112 Bcf), part of which is made available to other utilities. In providing storage and transportation services, Union receives most of the gas from the TCPL system at both ends of its Dawn-Trafalgar transmission system.
- 1.13 In the spring, summer and fall months, the TCPL system often has under-utilized capacity, which can be used to bring significant volumes of natural gas to the Union system for injection into the underground storage pools in southwestern Ontario. In winter months when demand for natural gas is high, TCPL's capacity is most often fully utilized. At these times, withdrawing gas from storage for use in southern Ontario reduces the amount that TCPL must

transport to Dawn and Trafalgar, thus making more gas available to other delivery points on TCPL's system.

Gas Storage in Ontario

- 1.14 The pinnacle reefs of southwestern Ontario constitute some of the best storage reservoirs in North America. They occur at subsurface depths of about 600 metres; are characterized by very high permeability and porosity; achieve heights well over 100 metres; are essentially sealed systems with relatively little or no gas leakage; and their performance can be readily monitored.
- 1.15 Underground storage in southwestern Ontario is essential for secure and reliable distribution of natural gas in Ontario. Not only does storage enable peak demands to be met in periods of high demand, it enables deliveries to continue when interruptions of service occur on the TCPL system or on pipelines or production facilities in western Canada. Fortunately, serious interruptions have been rare and when they have occurred owners of storage volumes shared their supply with others affected by the curtailment.

- 1.16 The Province of Ontario recognizes that depleted pinnacle reefs suitable for use as gas storage pools represent an important natural resource. Currently there are 17 active designated storage areas in the province, providing about $5,297 \times 10^6 \text{ m}^3$ (187.2 Bcf) of capacity. These are shown in Figure 2.
- 1.17 It should be noted that, upon designation of a pool, there are statutory restrictions relating to the stimulating or fracturing of wells within 1.6 km of the boundary of the designated gas storage area. Applications for such permits are referred to the Board pursuant to Section 11 of the Petroleum Resources Act. The Board is required to hold a public hearing before reporting to the Minister of Natural Resources.

History of the Applications

- 1.18 The Oil Springs East Pool was discovered by Husky Oil Limited of Calgary in the early 1970s. The location of the Pool is shown in Figure 2. The Pool commenced production of gas in September of 1974 and operated until September 1986 when it was shut-in. Total production of gas from the Pool amounted to $121.5 \times 10^6 \text{ m}^3$ (4.3 Bcf). A small amount of oil was also produced from one of the wells, however the

field is not considered suitable for further oil production.

- 1.19 The petroleum and natural gas ("P&NG") leases which allow the drilling of wells and the removal of hydrocarbons from the lands have been purchased by ICG for a total price of \$331,077.
- 1.20 The storage rights within the designated storage area are held by ICG and Union. ICG and Union signed a Memorandum of Agreement on November 13, 1989, under which ICG and Union respectively agreed to an 82.4 percent/17.6 percent ownership, use and development of the Pool. Costs will be shared in the same proportion. Union and ICG will execute and implement an Operating Agreement, wherein ICG will delegate to Union the responsibility for the operation of the Pool, including injections into and withdrawal from storage and the maintenance of the facilities. Union appeared before the Board in support of the applications by ICG.

The Hearing

- 1.21 Following the issuance of appropriate notices to all interested parties as directed by the Board, the hearing commenced at Sarnia on November 14, 1989 and concluded on November 16, 1989.

- 1.22 A copy of all exhibits and a verbatim transcript of the proceedings are available for public review in the Board's offices.

Appearances

- 1.23 Ten parties were represented by counsel as follows:

ICG	A. Dadson
Board Staff	R. Elliott
Union	L. Fedchun C. Jackson
James Mitchell, Sonja Mitchell, Thomas Anson Bailey, Catherine Bailey	W. Lang
Kriter Enterprises Ltd. and Lovat Land Consultants Limited ("Kriter and Lovat")	C. Lewis
Doug Harris	J. Carpino

Other parties were represented as follows:

Tecumseh Gas Storage	J. Tricker
T.A Evoy	Landowner, representing himself
J.K. Ward	Landowner, representing himself

Witnesses

1.24 The Applicant called the following witnesses:

D. Alexander	Manager of Operations, Technical Services, ICG
--------------	---

P. Walsh	President, Pinnacle Explorations Ltd.
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R. Reid	Manager, Gas Supply and Planning, ICG
---------	--

I. Moncrieff	President, Consolidated Environmental Group Limited
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B. Wilton	President, H.R. Wilton Resources
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P. Pastirik	Manager of Financial Planning, ICG
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The following company witness was called by
Union:

G.D. Black	Manager, Storage and Transportation Services, Union
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Messrs. Mitchell and Bailey called
as a witness:

T.A. Bailey	Landowner
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2. THE EVIDENCE AND ISSUES - AUTHORIZATION
TO INJECT STORE AND REMOVE GAS

ICG's Need for Storage

- 2.1 No party to the hearing challenged ICG's need for storage.
- 2.2 ICG's distribution areas are shown in Figure 3. ICG serves numerous industrial and commercial gas customers, who collectively account for approximately 78 percent of its annual load, the remainder of the load being consumed by ICG's residential gas customers.
- 2.3 The industrial and commercial demand is relatively uniform throughout the year, but residential consumption is seasonal. ICG has contracted for firm deliveries, which it receives from the TCPL pipeline, to enable it to meet the firm obligations it has to its

DISTRIBUTION NETWORK

APRIL 1989

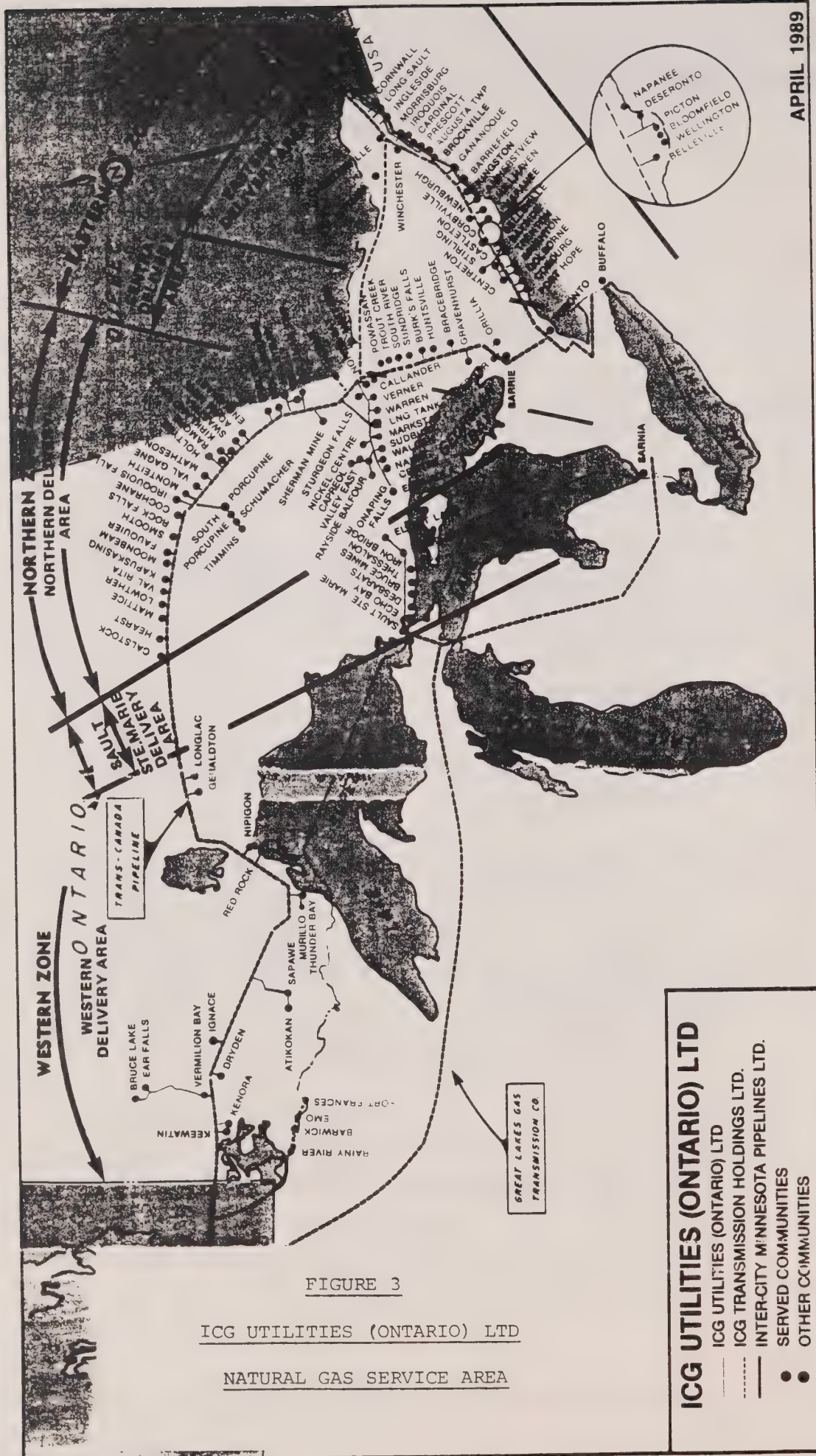


FIGURE 3

ICG UTILITIES (ONTARIO) LTD

NATURAL GAS SERVICE AREA

ICG UTILITIES (ONTARIO) LTD

ICG UTILITIES (ONTARIO) LTD

ICG TRANSMISSION HOLDINGS LTD.

INTERCITY MINNESOTA PIPELINES LTD.

SERVED COMMUNITIES

OTHER COMMUNITIES

customers at the coldest times of the year. Since the residential users have lower requirements in the other seasons, a great deal of ICG's contracted entitlement from the TCPL pipeline can go unused in the warmer months. The ratio of ICG's annual firm deliveries to annual firm entitlement is defined as ICG's "load factor".

ICG's Load Factor

- 2.4 Part of the payment made by a shipper, such as ICG, for transportation on the TCPL pipeline, is for fixed costs associated with the maximum volume that the shipper is entitled to take each day of the year. If the shipper can use all of this entitlement every day, his fixed costs are then spread over a large volume of gas. If, however, the entitlement is not used on certain days, the fixed costs are borne by a smaller volume and therefore the unit cost is higher. It is in ICG's interest to keep its load factor as high as possible in order to keep its unit cost of transportation low.
- 2.5 The availability of storage offers a shipper a means of meeting its peak day firm commitment to its customers while decreasing its firm entitlement from the pipeline. By injecting gas into storage on days when market demand is

less than the contractual entitlement, and then withdrawing from storage in cold periods to meet firm obligations that are above entitlement, the shipper raises its annual load factor. A utility like ICG, which has widely varying receipts from the TCPL pipeline, can make excellent use of storage to enable it to meet its obligations and, at the same time, raise its load factor for firm pipeline transportation service.

2.6 Another advantage of storage is the security it offers in the event of an interruption in supply caused either by production problems in the producing areas, or by deliverability restrictions on the TCPL system. The Applicant acknowledged that, in the event of a serious interruption in gas supply, it would be willing to share its storage volumes with other gas users in Ontario.

2.7 ICG is presently meeting its firm market obligations through Firm Service ("FS") and Firm Service-Transportation ("FST") from the TCPL pipeline, storage contracted with Union and its own LNG facilities. The present mode of operation yields an 85 percent load factor which is the lowest load factor of the three major utilities in Ontario. ICG claimed that its load factor will increase to 93 percent, if

the Pool is put into service, with a corresponding reduction in the cost of service to its customers.

Board Finding

- 2.8 The Board finds that ICG has substantiated its need for natural gas storage such as will be provided by the Oil Springs East Pool. The Board also believes that it is in the public interest to have as much gas storage available in Ontario as is reasonably possible.

Economic Benefits of the Oil Springs East Pool Project

- 2.9 ICG proposed to reduce its Operating Demand ("OD") for FS and FST by $250 \times 10^3 \text{ m}^3/\text{day}$ (8.8 MMCFD) in the eastern delivery area and by $150 \times 10^3 \text{ m}^3/\text{day}$ (5.3 MMCFD) in the western delivery area. The Applicant attested that TCPL has confirmed that it will accept these reductions. This would result in a saving to ICG of about \$2.65 million in 1991.
- 2.10 According to ICG, these reductions, combined with injections of gas into the Pool, will improve ICG's load factor from 85 percent in 1989 to 93 percent in 1991. The net effect of such an improvement would be a further annual saving of \$2.5 million, primarily on account of

the load factor dependent demand charge in its gas supply contracts with WGML. The sum of these two gas cost savings would thus be \$5.15 million annually in 1991. Underlying this calculation were certain assumptions regarding the escalation of savings and operating costs. These received critical review from Board Staff.

2.11 Offsetting these savings are the costs incurred in acquiring the storage rights, building and operating the facilities, and costs for Storage Transportation Service from Union and TCPL. The Applicant estimated the total in-service capital cost of the Pool at \$13,034,400 of which an amount of \$4,500,000 was incurred in acquiring land rights. This relates to payments for the petroleum and natural gas leases and storage rights. These leases and rights were originally obtained from the landowners in 1975 for a nominal consideration of either \$5 or \$1 per lease.

2.12 Royalty payments within the petroleum and natural gas leases were set by ICG at 3 percent for natural gas and 12 1/2 percent for oil. An annual payment of \$5 per acre was established as a delayed rental payment.

2.13 The Applicant has agreed to continue the \$5 per acre payment for storage rights as provided in

DECISION WITH REASONS

the leases and increase this by a further \$28 per acre upon commencement of injection into the pool, bringing the total to \$33 per acre. Further, the landowners will receive an annual payment of \$10 per acre related to the P&NG leases.

2.14 Separate from, and in addition to, payments to landowners, are the costs ICG and Union have incurred in the acquisition of the P&NG leases and storage rights held by others.

2.15 ICG purchased the P&NG rights as follows:

	<u>Seller</u>	<u>Amount</u>
81.25%	Pounder and Harmon	\$269,000
18.75%	Pension Fund Energy Resources Ltd	<u>62,077</u>
	Total	\$331,077.

2.16 Deducting this amount from the \$4,500,000 for land rights leaves \$4,168,923, which the Applicant confirmed is approximately the amount paid to Kriter and Lovat for the storage rights for 350 acres of the 400 acres contained within the boundary of the designated storage area. Union holds the storage rights for the remaining 50 acres. ICG's witness stated that the current value for such rights relating to a storage

pool of known capacity is in the order of \$1 million per Bcf. The witness stated that the amount paid for the rights to the Oil Springs East Pool is similar to that paid in other instances in Ontario.

- 2.17 The Applicant provided a schedule of estimated annual cash inflows from cost savings, and estimated cash outflows due to all capital and operating costs, which showed that the project reaches break-even by the year 2008. Over a 30 year period the storage project produces an internal rate of return of 13.8 percent, which compares favourably to ICG's approved weighted cost of capital of 12.12 percent.

Board Findings

- 2.18 The Board is concerned with the magnitude of the payment made by ICG for the storage rights held by parties other than the landowners. The Applicant should be mindful that the appropriateness of such costs being included in its rate base will not be assured, or dealt with, until ICG's next rate case.
- 2.19 The economic analysis presented by the Applicant made an assumption that the savings emanating from the reduction of OD and the increase in

load factor would inflate at 5 percent per year. The Board doubts the validity of such an assumption since transportation tolls on transmission pipelines have varied from this figure over the past 5 years and, in fact, TCPL's tolls for firm service are lower in 1989 than they were in 1984. The Applicant acknowledged that pipeline tolls tend to reduce as a result of depreciation but increase through general inflation in the costs for labour, parts and service.

2.20 The Board views the Applicant's economic analysis as a somewhat optimistic estimate of future savings. Notwithstanding the foregoing concerns, the Board finds that the Pool will provide a reduced cost of service to ICG's customers and an economic benefit to local landowners over the life of the project.

2.21 The Board also notes that if ICG can gain sufficient flexibility in its gas supply arrangements, either due to increases in system demand or through negotiated reductions in its contract volumes from WGML, ICG would then have the capability to purchase spot gas for injection into the Pool at the best possible prices and thereby further improve the economics of its storage operation.

Injection and Removal of Gas from the Pool

2.22 Evidence was presented by ICG's witness that the Oil Springs East Pool is a pinnacle reef that developed in the Guelph formation and is similar in age and geology to other reefs now being used for gas storage in southwestern Ontario. As shown in Figure 4, these reefs are located within an area beginning in western Michigan and extending eastwards into Ontario.

2.23 A simplified cross-section of the formations surrounding a typical pinnacle reef is shown in Figure 5. This figure shows how the A1 carbonate and the A2 salt flank the Guelph reef which, in turn, is overlain by A2 anhydrite. The anhydrite rock is impermeable and therefore traps the gas beneath it.

A1 Carbonate Observation Well

2.24 The Applicant's expert witness testified that when the Pool was shut-in, its residual gas pressure was 345 kPa (50 psig). A pressure reading taken in August of 1987 showed an increase to 551 kPa (80 psig), which indicates that gas has migrated into the Guelph formation from the adjoining lower permeability and higher density A1 carbonate. The witness estimated that 150 MMCF of natural gas has probably

SOUTHWESTERN ONTARIO

SHOWING

PINNACLE REEF BELT
ON SHORE



FIGURE 4

PINNACLE REEF BELT

SOUTHWESTERN ONTARIO

migrated back into the reef. ICG proposes to inject a further $24.0 \times 10^6 \text{ m}^3$ (.85 Bcf) of cushion gas to pressure the reservoir to 2,069 kPa (300 psig), the design cushion pressure.

2.25 ICG proposes to inject $134.4 \times 10^6 \text{ m}^3$ (4.75 Bcf) of working storage gas into the Pool in addition to the cushion gas and to operate the Pool up to 7,998 kPa (1,160 psig). While this pressure is higher than the discovery pressure of the Pool 6,378 kPa (925 psig), ICG noted that it is in line with the generally recognized pressure limitation of 0.7 psi per foot of depth to the top of the reef.

2.26 The Applicant's expert witness found, from his examination of well bore data and density logs, that the porosity of the Guelph formation is in the order of 9 percent, which is typical of such reefs in southwestern Ontario. He also estimated water saturation to be 15 percent. These characteristics, in his opinion, make the storage pool a good candidate for frequent recycling, if ICG and Union wish to operate in this manner. No challenge was made to this evidence.

SCHEMATIC SECTION
TYPICAL PINNACLE REEF

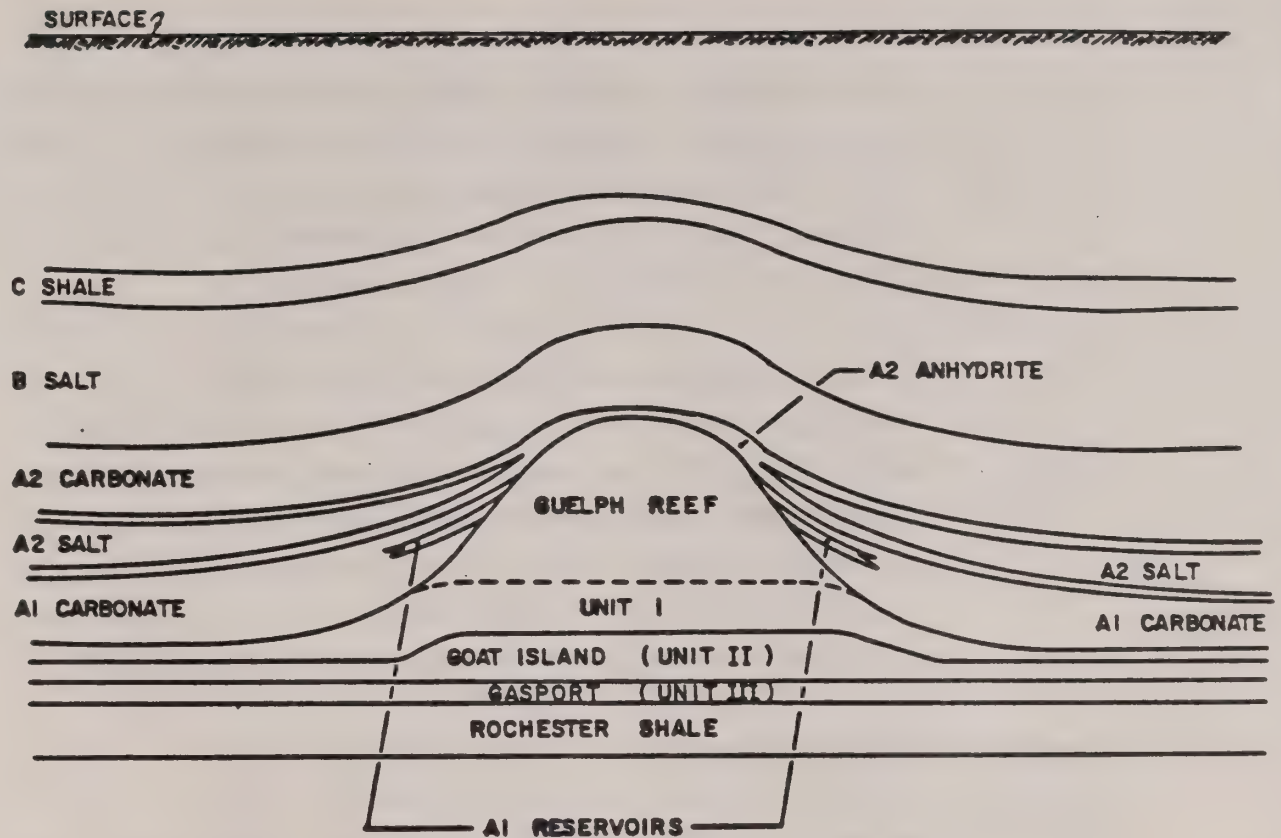


FIGURE 5

SCHEMATIC SECTION

TYPICAL PINNACLE REEF

ICG UTILITIES (ONTARIO) LTD

SCALE

N.T.S.

- 2.27 Board Staff proposed that an observation well be provided to monitor the migration of gas into and out of the adjoining A1 carbonate deposit and in order to enhance inventory control over the gas in the Pool.
- 2.28 The Applicant testified that the cost of a new well for such purposes would be in the order of \$250,000. It believed, however, that the same objective could be achieved by converting one of the existing wells (Husky Union Enniskillen 4-22-II) to an A1 observation well. The cost of this conversion was estimated at \$40,000.

Coring of the Cap Rock

- 2.29 As shown in Figure 5, the usual overlying cap rock that traps gas within a Guelph reservoir is A2 Anhydrite. However, core samples taken from the Enniskillen 5-22-II well indicate a dense impermeable lime cap which contains some anhydrite within it.
- 2.30 Board Staff raised a concern that there is little evidence to confirm that the cap rock has strength and density characteristics adequate for delta pressuring and therefore advocated that core samples be taken in the cap rock stratum from one of the new wells to be drilled.

2.31 The Applicant's expert witness did not share these concerns, noting that a core would cost in the order of \$40,000. He further noted that the Dawn 167 Pool, operated by Union, contains a similar cap rock and is currently delta pressured to the 0.7 psi per foot of depth limiting pressure gradient. However, he did concede that a core sample would be useful to examine the lithology of the rock and to undertake a stress test to determine how fragile it might be.

Operation of the Pool

2.32 The Applicant confirmed that Union will operate and maintain the Pool as an integral part of Union's overall storage operations. The Applicant will nominate the volumes it wishes to inject into storage and similarly will nominate the volumes it wishes to withdraw from storage. These nominations are restricted only by ICG's contractual agreements for transportation with Union and TCPL. Union's witness confirmed that volumes nominated by ICG for both injection and withdrawal will be deemed as applying to the Oil Springs East Pool, but in reality they may flow into or out of any of the pools that Union operates, depending on which pools Union is using at the time. He further stated that it is not uncommon for injections

and withdrawals to occur on the same day, depending on weather conditions.

2.33 Board Staff argued that since operation of the Pool will be carried out entirely by Union, most of the benefit of the additional $133.0 \times 10^6 \text{ m}^3$ (4.7 Bcf) of storage capacity may disproportionately benefit Union's customers. Board Staff therefore suggested that ICG and Union should establish a joint venture for the operation of the Pool, similar to that existing between Union and Imperial Oil Limited for the operation of the Bickford and Sombra storage pools, with rates for storage being set by the Board.

2.34 ICG and Union pointed out that under the deeming procedure, ICG would have access to, and availability of, storage on 365 days of the year, regardless of the condition of the Oil Springs East Pool.

Board Findings

2.35 ICG has demonstrated to the satisfaction of the Board that there is substantial need for the development and operation of the Pool as a storage reservoir. The Board agrees with ICG that the storage area can produce benefits in

security of supply as well as an overall reduction in cost of service to ICG's customers. The Board is further satisfied that there is no other viable alternative to the development of the storage capability of the Pool that can be made available at the present time to ICG's customers.

2.36 ICG has demonstrated to the satisfaction of the Board that this economically significant resource should be utilized for gas storage purposes for the benefit of the customers of ICG and Union and to the benefit of local landowners.

2.37 The evidence presented to the Board makes it clear that the development of the storage capability of the Pool is required on an urgent basis if such capability is to be employed for the heating season of 1990-91.

2.38 The Board finds that the level of delta pressure proposed by the Applicant for the Pool is within the accepted limit of 0.7 psi per foot of depth and is, therefore, appropriate.

2.39 The Board notes that only one of the delta pressured storage pools operated by Union in southwestern Ontario has no Al carbonate observation well. However, Union has filed an

application with the Petroleum Resources Section of the Ministry of Natural Resources for an A1 carbonate observation well in that pool.

2.40 The Board concurs with ICG's proposal to convert the Husky Union Enniskillen 4-22-II well for A1 carbonate observation purposes. However the Board stipulates that if, after a period of eighteen months from the commencement of injection into the Pool, the well, in the Board's opinion based on monitoring data to be supplied by ICG, is found to be incapable of properly monitoring the migration of gas into and from the A1 carbonate, a new A1 carbonate observation well is to be drilled.

2.41 It is the Board's view that the Oil Springs East Pool is an important provincial resource that must be preserved. The Board believes that while it is unlikely that the cap rock will be impaired resulting in loss of gas from the formation, the cost of confirming the cap rock properties is well justified in the public interest. The Board will, therefore, order the Applicant to take cores on one of its injection and withdrawal wells to a depth of at least 10 m above and 10 m below the top of the Guelph formation.

2.42 The Board is concerned that adequate gas inventory control procedures be implemented by ICG, particularly since there is the possibility of some gas migration into the A1 carbonate formation. Therefore ICG shall provide the Board with an annual report identifying and explaining all material gas losses and estimates of non-effective gas associated with migration into the A1 carbonate formation. It shall also update this information to provide current estimates for the test year in all future rate cases.

2.43 The Board views the deeming procedure as sensible since it offers ICG the potential use of storage 365 days a year, independent of the condition of the Oil Springs East Pool, and offers Union the potential of frequent use of the Oil Springs East Pool if it has efficient operating characteristics. This offers ICG a substantial potential benefit, in that frequent cycling of the storage capacity, involving more than one filling and emptying during a year, can further improve ICG's annual load factor.

2.44 The Board is of the view that the Ontario Energy Board Act does not require the person authorized to inject, store and withdraw gas to perform the actual operation. In this particular case, substantial economies are realized by

having the operation performed by Union. The Board is also pleased that there has been, and will be, close liaison on the technical aspects of this project between Union and ICG which it believes will broaden the expertise and experience of both parties.

- 2.45 The Board will therefore grant ICG's application for leave to inject gas into, store gas in and remove gas from, the Oil Springs East Pool, subject to the conditions of approval set out in Appendix II of this Decision which shall be attached to the Board's Order.

3. THE EVIDENCE AND ISSUES -
LEAVE TO CONSTRUCT FACILITIES

The Transmission Pipelines

3.1 ICG testified that it requires pipeline facilities and a compressor station to connect Union's Dawn to Trafalgar transmission system to the Pool, to allow natural gas to be transported to and from the Pool. The pipeline facilities comprise:

370m of NPS 12 transmission pipeline joining the Union Dawn-Trafalgar transmission line to ICG's compressor station;

350m of NPS 12 transmission pipeline leading from the compressor station to smaller transmission or gathering pipelines which connect to the wells;

670m of NPS 6 gathering pipelines; and

90m of NPS 8 gathering pipelines.

Collectively these pipelines constitute, "the Transmission Pipelines".

The Transmission Pipelines and compressor station are shown in Figure 6.

3.2 The lands overlying the Oil Springs East Pool have been designated as a gas storage area by O. Reg. 690/89. The evidence of need related to authorization to inject, store and remove gas is accepted as supporting ICG's application for leave to construct the Transmission Pipelines and related facilities.

3.3 According to ICG's evidence, the development of the Oil Springs East Pool will provide a storage capacity of $134.4 \times 10^6 \text{ m}^3$ (4.75 Bcf). This capacity will be achieved by compressing natural gas received via Union's Dawn-Trafalgar system and the Transmission Pipelines and injecting it into the Pool through a total of 6 injection and withdrawal wells, to be drilled for this purpose, located as shown in Figure 6.

Husky-Union Enkistellen 4-22-II

Husky-Union Enkistellen 3-23-II

TO OIL SPRINGS

21

22

Camel Talcorp 4A-22-II

LOT 22

LOT 23

LOT 23

LOT 24

EARL B. THOMPSON
JOHANNA M.T. THOMPSON

THOMAS A. BAILEY
CATHERINE H.A. BAILEY

JAMES A. MITCHELL

Enkistellen 5-22-II

CREEK

GATHERING SYSTEM

ACCESS ROADS

CLASS LOCATION 1

SPECIFICATIONS

Q.D. - 223.8 mm (12")	H.W.P. - 8800 MP/435 OF S.H.T.B.
V.T. - 12.7 mm	H.W.P. - 8100 MP/435 OF S.H.T.B.
W.C. - CMA 2248, 1 CAT. 1 8N. 280	H.W.P. - 8100 MP/435 OF S.H.T.B.
H.T. - 319 mm (12")	P.T.P. - 1400 MP/435 OF S.H.T.B.
Q.D. - 219 mm (8")	H.W.P. - 8800 MP/435 OF S.H.T.B.
V.T. - 12.7 mm	H.W.P. - 8100 MP/435 OF S.H.T.B.
W.C. - CMA 2248, 1 CAT. 1 8N. 280	H.W.P. - 8100 MP/435 OF S.H.T.B.
H.T. - 319 mm (12")	P.T.P. - 1400 MP/435 OF S.H.T.B.
Q.D. - 168.3 mm (6")	H.W.P. - 8800 MP/435 OF S.H.T.B.
V.T. - 12.7 mm	H.W.P. - 8100 MP/435 OF S.H.T.B.
W.C. - CMA 2248, 1 CAT. 1 8N. 280	H.W.P. - 8100 MP/435 OF S.H.T.B.
H.T. - 319 mm (12")	P.T.P. - 1400 MP/435 OF S.H.T.B.

TO TORONTO

25" 34" 8" 42" LINES

PROPOSED OIL SPRINGS EAST FIELD DEVELOPMENT

PROPOSED TRANSMISSION LINE

DAWN TRAFALGAR

CON. 2
CON. 1

TO TOWN
COMPRESSOR

ICG UTILITIES (ONTARIO) LTD

OIL SPRINGS EAST STORAGE PROJECT

SCALE N.T.S.

FIGURE 6

LAYOUT OF FACILITIES

- 3.4 The compressor station, consisting of two 1000 horsepower reciprocating units, will be capable of compressing natural gas either into the Pool or into the Union transmission system.
- 3.5 Injections of gas into the Pool will occur in periods of low demand on ICG's system. At the end of the winter heating season when the Pool has been depleted or nearly so, the pressure of the gas remaining in the Pool will be low. When injections commence, gas will flow directly from Union's transmission line through metering equipment and then into the Pool. When the pressure in the Pool rises to equilibrium with the pressure in Union's pipeline, the compression equipment will then be operated so as to compress the gas to a pressure of 7998 kPa (1160 psig) which will then flow into the Pool to fill its entire capacity.
- 3.6 In cold weather, when gas is removed from storage it will flow from the Pool through the metering and volume control equipment directly into Union's transmission pipeline so long as the pressure in the Pool is higher than the pressure in Union's line. When pressure equilibrium has been reached, the compressors will be put into operation so that gas is withdrawn from the Pool and discharged into

Union's pipeline at a pressure no higher than Union's maximum allowable operating pressure ("MAOP").

- 3.7 Maximum flows rates during both the injection and withdrawal cycles will approximate $5100 \times 10^3 \text{ m}^3/\text{day}$.

Design Criteria

- 3.8 The Transmission Pipelines will be designed in accordance with the Canadian Standards Association Code Z184-M86 "Gas Pipeline Systems" and O. Reg. 627/87. The class location of the proposed pipelines is class 1, which is characterised by low population density in a rural environment. The pipelines however have been designed using a class 2 design factor related to characteristics associated with a medium density rural or urban environment.

- 3.9 That portion of the Transmission Pipelines between the compressor station and the 6 wells will be pressure tested using either water, air or nitrogen to 14893 kPa (2160 psig). This will result in a maximum allowable operating pressure for that portion of the system of 9929 kPa (1440 psig). The intended operating pressure is 7998 kPa (1160 psig). That portion of the Transmission Pipelines between the

compressor station and Union's transmission line will be similarly tested. However, it must have a lower MAOP equal to the MAOP of the Union pipeline. The Transmission Pipelines will have a minimum depth of ground cover of 1 metre.

- 3.10 Once the system has been pressure tested and made available for operation, Union will assume operating control of the Pool. Routine maintenance and any subsequent operating problems or malfunction, will be the responsibility of Union.

Board Findings

- 3.11 The Board is satisfied that the proposed facilities including 6 injection/withdrawal wells, the Transmission Pipelines, compression and metering equipment are needed for the purposes of operating the Pool.
- 3.12 The Board finds that the Transmission Pipelines have been designed to the appropriate requirements of the Canadian Standards Association Code and O. Reg. 627/87.

Capital Expenditures

- 3.13 The Applicant submitted evidence that the capital cost of the facilities, including

interest during construction, is approximately \$13,004,000. These costs were subsequently increased by \$30,000 due to the proposed relocation of the compressor station and the addition of 200 m of NPS 12 transmission line. A summary of the revised costs is shown in Table 1.

- 3.14 Board Staff submitted that ICG had not made provision for the cost of purchasing the existing gas in situ from the lessors holding land overlying the Pool. ICG's most recent offer for this gas amounted to \$133,200. ICG accepted this as a reasonable estimate of the compensation that may be paid, but claimed that it would have no material impact upon the economic feasibility of the project.

Board Finding

- 3.15 The Board finds that, apart from its concerns about the acquisition of the P&NG leases and the gas storage rights for \$4,500,000, ICG's proposed level of expenditure is appropriate, subject however, to adjustments for the gas in place, the A1 observation well and cap rock coring.
- 3.16 The Board finds that allowance should be made for the estimated compensation of \$133,200 to

TABLE 1
Oil Springs East Pool
CAPITAL COSTS
(\$1,000's)

<u>1989</u>	<u>TOTAL</u>
Land	\$ 45.0
Land Rights	4,500.0
Structures & Improvements	190.0
Wells	100.0
Well Equipment	Nil
Transmission Pipelines	17.5
Compressor Equipment	455.0
Measuring & Regulating Equipment	<u>137.5</u>
Sub-Total Project	\$ 5,445.0
AFUDC	<u>81.5</u>
SUB-TOTAL	<u>\$ 5,526.5</u>
 <u>1990</u>	
Land Rights	\$ 6.0
Structures & Improvements	975.0
Wells	690.0
Well Equipment	510.0
Transmission Pipelines	510.5
Compressor Equipment	1,187.5
Measuring & Regulating Equipment	1,490.1
Base Pressure Gas	<u>1,870.0</u>
Sub-Total Project	\$ 7,239.1
AFUDC	<u>268.8</u>
SUB-TOTAL	<u>\$ 7,507.9</u>
TOTAL PROJECT	<u>\$13,034.4</u>

be paid for the gas in situ and \$80,000 for the A1 observation well and the cap rock coring.

- 3.17 The revised estimated cost of developing the Pool is therefore \$13,247,600 as shown below.

<u>Item</u>	<u>(\$ 1,000's)</u>
ICG estimate (Table 1)	<u>\$13,034.4</u>
Cost of Coring	40.0
Conversion of well 4-22-II	40.0
Compensation for gas in-situ	<u>133.2</u>
TOTAL	\$13,247.6

Economic Feasibility

- 3.18 The economic feasibility study submitted by ICG consisted of a discounted cash flow (DCF) analysis which considered the costs and revenues associated with development of the entire Pool. Board Staff considered development of the Pool to be economically justified, but expressed concern with regard to some of the assumptions used in the discounted cash flow analysis.
- 3.19 Board Staff argued that ICG had compared the computed internal rate of return on the project of 13.8 percent to ICG's present incremental

cost of capital, namely 11.86 percent. Board Staff submitted that the appropriate comparison should be with the Board's approved weighted average cost of capital, namely 12.12 percent, since projects earning less than this rate are being subsidized by current ratepayers.

- 3.20 ICG argued that the use of the incremental weighted average cost of capital is consistent with the principles set forth in the Board's Decision dealing with system expansion (E.B.O. 134). ICG also claimed that if it were obliged to use the most recently approved weighted average cost of capital, then in a climate of decreasing interest rates it might have to forgo projects which it would otherwise find economically feasible.

Board Finding

- 3.21 The Board has previously noted some of its concerns about the assumptions adopted by ICG in its economic feasibility study for the Pool, but has accepted the overall viability of the project as a basis for granting leave to inject, store and withdraw gas from the Pool.
- 3.22 The Board finds that as a general proposition, the internal rate of return of a capital project should be compared to the most recently approved

weighted average cost of capital. However, the Board notes that the most recent Decision for ICG rates (E.B.R.O. 440) was for a prospective test year ending December 31, 1988. Since the capital costs of the Pool will not be included in rate base until 1990, the Board accepts the use of the estimated 1990 weighted average cost of capital, as used by ICG in this instance.

Environmental Matters

- 3.23 The Board heard evidence from both the Applicant and its environmental consultant, that proper precautions have been, and will be, taken to safeguard the ecology in the designated storage area. Also, the Applicant indicated that it had made a significant effort to accommodate the concerns and interests of the landowners.
- 3.24 As noted earlier, the Transmission Pipelines are necessary to connect the storage facilities to Union's Dawn-Trafalgar transmission line. The storage facilities, comprising six injection and withdrawal wells to be drilled on the Pool, along with the Transmission Pipelines and the compression and metering equipment, are necessary to the operation of the Pool.

- 3.25 The Applicant's environmental assessment report was prepared in accordance with the Ontario Energy Board's "Environmental Guidelines for Locating, Constructing and Operating Hydrocarbon Pipelines in Ontario - 3rd Edition".
- 3.26 The major issues identified in the report which require action by ICG and its contractors are:
- a) Amelioration of impacts and restoration of damage associated with the construction of the Transmission Pipelines;
 - b) Amelioration and restoration of land damage associated with construction of the compressor station;
 - c) Amelioration and restoration of land damage associated with drilling the injection and withdrawal wells; and
 - d) Visual and noise impacts of the compressor station on neighbouring residences.
- 3.27 The Applicant, in its prefiled testimony, confirmed that it will comply with the mitigation measures recommended in the environmental assessment report and will include this report in its pipeline and drilling contracts.

- 3.28 The Applicant also testified that all construction and cleanup of the Transmission Pipelines and compressor station will be carried out in accordance with its standard construction specifications and inspection of this work will be performed by ICG and the affected landowners.
- 3.29 In particular, topsoil stripping has already occurred on the Mitchell property. Upon completion of construction, and when dry weather conditions exist, the sub-soil will be chisel ploughed and stone picked. The topsoil will then be re-spread, tilled and stone picked.
- 3.30 The applicant engaged the services of the Museum of Indian Archeology (London), an affiliate of the University of Western Ontario, to make an assessment of historic and archeological sites in the storage areas. The consultant's report, submitted as an exhibit in the hearing stated that "No prehistoric or early historic artifacts or sites were found" and concluded "the proposed undertaking will not impact any significant heritage resources."

Board Findings

- 3.31 The Board notes that the mitigation recommendations regarding the pipeline routes, well sites and the relocation of the compressor

station, deal thoroughly with the protection of the ecology of the area and will ensure proper rehabilitation of the lands after construction is complete.

- 3.32 A matter of concern to the Board is the preservation of archeological sites in Ontario. In this regard, the Board notes that no early historic artifacts or sites apparently exist in the area impacted by the Oil Springs East Pool project.

Noise Abatement

- 3.33 ICG was requested to undertake a Noise Impact Assessment for the proposed compressor station, in accordance with NPC-133 contained within the Model Municipal Noise Control Bylaw, August, 1978, issued by the Ministry of the Environment. ICG claimed that its proposed design meets the requirements of both NPC-132 "Guideline for Noise Control in Rural Areas" and NPC-133 "Guideline on Information Required for the Assessment of Planned Stationary Sources of Sound". In both guidelines, the sound level restriction for a stationary source is 50 decibels (dBa) within 30 m of a residence and the compressor station has been specified to meet these requirements.

- 3.34 To meet these sound level restrictions, ICG has requested the compressor manufacturer to ensure a noise level of no more than 50 dBa at 150 m from the compressor building, which is the closest distance to the ICG property line.
- 3.35 ICG also undertook to relocate the compressor station 120 m to the west, following a request from the Baileys, so that it would no longer be in a direct sight line from the Bailey residence. In the new location there will also be more trees to buffer the sound..
- 3.36 ICG also agreed that it would relocate the aftercoolers to the south of the compressor building, thereby directing the sound from these in a southerly direction. The relocation of the compressor station adds approximately 200 m to the length of NPS 12 transmission line required and \$30,000 to the total project cost.
- 3.37 In respect of noise emissions, Board Staff proposed that ICG must apply to the Ministry of the Environment for a Certificate of Approval.

Board Finding

- 3.38 The Board finds the general design of the compressor station to be in accordance with accepted provincial guidelines. However, ICG

shall obtain, from the Ministry of the Environment, a Certificate of Approval in accordance with Section 8 of the Environmental Protection Act, regarding the emission of contaminants into the natural environment. A copy of the Certificate of Approval shall be filed with the Board prior to injection of gas into the Pool.

Landowner Concerns

3.39 The Board heard evidence that all landowner compensation matters have been settled in regard to the properties under which the designated storage area lies.

3.40 Mr. Lang, Counsel for Mr. and Mrs. Bailey, expressed concerns about a water well situated on the Bailey's property which they intend to use for their livestock. ICG's environmental consultant stated that the pipeline construction would not interfere with the well. However he indicated that to avoid any possible contamination of water aquifers from brine or drilling fluids, a plastic liner should be used in the soup hole of any rotary drilled wells. He also stated that the same risk of contamination is not present with cable tool drilled wells, since such drilling rigs use above ground storage tanks.

3.41 Mr. T.A. Bailey gave a gracious and clear review of the sequence of events that had taken place during the past eight months relating to dealings between the Mitchell and Bailey families and the Applicant, its agents and consultants. Mr. Bailey described the tensions and stresses caused to landowners when confronted by, and involved in, a project so strange to the normal course of their lives.

3.42 While the Baileys and Mitchells have no opposition to the use of the Pool as a storage area, they urged that, in future projects, landowners be much more openly informed about plans involving their lands. They also supported the position of Board Staff regarding noise abatement and the proposed conditions of approval.

Board Findings

3.43 The Board appreciates the assistance given by the landowners through their evidence and statements of concern and notes that all compensation issues have been settled.

3.44 The Board finds that the Applicant has provided a comprehensive environmental assessment report and that the recommendations it contains for the protection and restoration of the lands are

satisfactory. The Board directs that, in particular, all mitigation measures recommended by the environmental consultant are to be followed.

- 3.45 The Board also notes that the Applicant has properly addressed landowner concerns about the visual impact of its compressor station by changing its location so as to remove it from the view of adjacent residences.

Timing of the Pipeline Construction

- 3.46 ICG testified that the Transmission Pipelines are an essential component of the facilities required to bring the Oil Springs East Pool into operation. Early completion will permit injections of natural gas into the Pool directly from the Union Dawn-Trafalgar line during the summer of 1990 and prior to the commissioning of the compressor facilities. Therefore the Applicant claimed that it is urgent that it commence the construction of the Transmission Pipelines as early in 1990 as weather and ground conditions permit.

- 3.47 Board Staff expressed concern that the probable delays to ICG's construction schedule could result in added costs to facilitate withdrawal of gas from the Pool by November 1990. Board

Staff took the position that any expenditures that ICG might make to facilitate construction before approval of the project by the Board should be a financial liability of ICG's shareholders.

Board Findings

- 3.48 The Board expects that with the issuance of this Decision, ICG will be in position to commence construction of the Transmission Pipelines and compressor station by April 1990. The Board understands that drilling permits for the six injection and withdrawal wells have been issued by the Petroleum Resources Section, Ministry of Natural Resources, and that ICG expects to have these six wells completed by the end of March.
- 3.49 Under these circumstances, injection of gas should be able to commence during the late part of the summer, and be available for withdrawal next winter. The costs of the project should not escalate as a result of any delay in regulatory approval.

4. SUMMARY OF BOARD FINDINGS

Authorization to Inject, Store and
Remove Gas from the Pool

- 4.1 The Board finds that ICG has substantiated its need for natural gas storage such as will be provided by the Oil Springs East Pool. The Board also believes that it is in the public interest to have as much gas storage available in Ontario as is reasonably possible.
- 4.2 The Board is concerned with the magnitude of the payments made by ICG for the storage rights held by parties other than the landowners. The Applicant should be mindful that the appropriateness of such costs being included in rate base will be examined in ICG's next rate case.
- 4.3 The Board views the Applicant's economic analysis as an optimistic estimate of future savings. However, the Board is satisfied that

the Pool will provide a reduced cost of service to ICG's customers and an economic benefit to local landowners over the life of the project.

- 4.4 The Board finds that the level of delta pressure proposed by ICG for the Pool is within the accepted limit of 0.7 psi per foot depth and is therefore appropriate.
- 4.5 The Board concurs with ICG's proposal to convert the Husky Union Enniskillen 4-22-II well to an A1 carbonate observation well. However it stipulates that, if from a period of 18 months after commencement of injection into the Pool, the well does not, in the Board's opinion based on monitoring data supplied by ICG, adequately monitor migration of gas to and from the A1 carbonate, a new A1 observation well is to be drilled.
- 4.6 The Board considers the cost of confirming the cap rock properties to be justified. The Board will therefore order the Applicant to take cores on one of its injection and withdrawal wells to a depth of at least 10 m above and 10 m below the top of the Guelph formation.
- 4.7 The Board will require ICG to provide it with an annual report identifying and explaining all material gas losses and estimates of non-effective gas associated with migration into

the A1 carbonate formation. ICG shall update this information for the test year in all future rate cases.

4.8 The Board is of the view that the Act does not require the person authorized to inject, store and remove gas to perform the actual operation.

4.9 The Board grants leave for ICG to inject gas into, store gas in and remove gas from the Oil Springs East Pool, subject to the Conditions of Approval found in Appendix II. The Board will issue its Order to this effect.

Leave to Construct Facilities

4.10 The Board is satisfied that the proposed facilities including 6 injection/withdrawal wells, the Transmission Pipelines, compression and metering equipment are needed for the purposes of operating of the Pool.

4.11 The Board finds that the Transmission Pipelines have been designed to meet the appropriate requirements of the Canadian Standards Association Code and O. Reg 627/87.

4.12 The Board finds the Applicant's capital cost estimate appropriate, apart from concerns about

the cost of land rights, and finds that adjustments should be made of \$133,200 for the gas in situ and \$80,000 for an Al carbonate observation well and coring of the cap rock. The revised estimated cost of developing the Pool is therefore \$13,247,600.

- 4.13 The Board agrees that as a general proposition the internal rate of return should be compared to the most recently approved weighted average cost of capital. However, the Board notes that the most recent Decision for ICG rates was for a prospective test year ending December 31, 1988. Since the capital costs of the Pool will not be included in rate base until 1990, the Board accepts the use of the estimated 1990 weighted average cost of capital, as used by ICG in this instance.
- 4.14 The Board finds that, generally, the compressor station is designed in accordance with accepted provincial guidelines. However, ICG shall obtain from the Ministry of the Environment a Certificate of Approval, in accordance with Section 8 of the Environmental Protection Act, regarding the emission of contaminants into the natural environment. A copy of the Certificate shall be filed with the Board prior to injection of gas into the Pool.

- 4.15 The Board appreciates the assistance given by the landowners through their evidence and statements of concern and notes that all compensation issues have been settled.
- 4.16 The Board finds that the Applicant has provided a comprehensive environmental assessment report and that the recommendations it contains as to protection of the lands are satisfactory. In particular all mitigation measures recommended by the environmental consultant are to be followed.
- 4.17 The Board also notes that the Applicant has properly addressed landowner concerns about the visual impact of its compressor station by changing the location so as to remove it from the view of landowners.
- 4.18 The Board grants leave for ICG to construct the facilities described in its Application, subject to the conditions contained in Appendix III, which will be attached to Board's Order.

5. COSTS AND COMPLETION OF PROCEEDINGS

Costs

- 5.1 The Board previously made its findings in respect of intervenor costs and Board costs in these combined proceedings in its Report to the Lieutenant Governor in Council dated December 7, 1989. As part of its Orders in these proceedings the Board will require the Applicant to pay intervenors' costs and Board costs in accordance with its said findings, as follows:
- 5.2 With regard to the participation of landowners, the Board finds that their contributions were most helpful and, therefore, they are entitled to honoraria. Accordingly, the Board finds that, upon receipt of the Board's Orders, the

DECISION WITH REASONS

Applicant shall forthwith pay honoraria in amounts as follows to:

James and Sonja Mitchell	\$450
Thomas and Catherine Bailey	\$450
T.A. Evoy	\$450
J.K Ward	\$300
Doug Harris	\$150

5.3 In addition the Applicant shall pay, upon the Board's Order, the reasonably incurred legal costs of the Mitchells, the Baileys, and of Mr. Harris as assessed by the Board's Assessment Officer. Messrs Mitchell, Bailey and Harris are hereby directed to submit an accounting of their legal costs to the Board's Assessment Officer within 10 days of the issuance of the Board's Decision herein.

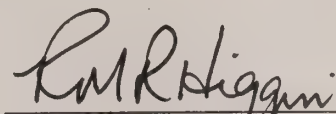
5.4 The Board also directs the Applicant to pay the Board's costs after they have been determined and an appropriate Cost Order issued.

Completion of the Proceedings

5.5 The Board will issue its Orders in due course.

DECISION WITH REASONS

DATED AT TORONTO, this 8th day of February,
1990.



R.M.R. Higgins
Presiding Member



R.D. Walker
Member

Appendix I

SCHEDULE "A"
DESCRIPTION
LOTS 22 AND 23
CONCESSION 2
TOWNSHIP OF ENNISKILLEN
COUNTY OF LAMBTON

The parcel of land in the Township of Enniskillen, County of Lambton and Province of Ontario, being composed of Lots 22 and 23 in Concession II of the said Township, described more particularly as follows:

COMMENCING at the Northwest angle of Lot 22, Concession II.

THENCE Easterly along the North limit of the said lot, six hundred and seven and five tenths metres (607.5) to the Northeast angle of the said Lot.

THENCE Easterly along the North limit of Lot 23, six hundred and seven and six tenths metres (607.6) to the Northeast angle of the said Lot 23.

THENCE Southerly along the East limit of the said Lot 23, one thousand three hundred and thirty nine and two tenths metres (1339.2) to the Southeast angle of the said Lot.

THENCE Westerly along the South limit of the said Lot 23, six hundred and five and seven tenths metres (605.7) to the Southwest angle of the said lot.

THENCE Westerly along the South limit of Lot 22, six hundred and nine and seven tenths metres (609.7) to the Southwest angle of the said Lot 22.

THENCE Northerly along the West limit of the said Lot 22, one thousand three hundred and forty and seven tenths metres (1340.7) to the POINT OF COMMENCEMENT.

Appendix II

CONDITIONS OF APPROVAL - AUTHORIZATION TO INJECT STORE AND REMOVE GAS

1. ICG shall convert the Enniskillen 4-22-II well for use as an A1 observation well. If, after 18 months from the date of first injection, the converted Enniskillen 4-22-II observation well does not, in the Board's opinion based on monitoring data supplied by ICG, adequately monitor migration of gas to and from the A1 carbonate, then ICG shall drill a new observation well into the A1 carbonate reservoir known to be in communication with the Guelph gas reservoir.
2. ICG shall core one of the proposed injection and withdrawal wells at the time of drilling, to a depth of at least 10 metres above and 10 metres below the top of the Guelph formation. The entire core shall be made available to the Petroleum Resources Section, Ministry of Natural Resources, within three months of being drilled.
3. ICG shall provide the Board's designated representative with an annual report identifying and explaining all material gas losses and estimates of non-effective gas, associated with the

operation of the Oil Springs East Pool. ICG shall update this report prior to any hearing in respect of any main rate case.

4. ICG shall not operate the Oil Springs East Pool above a pressure representing a pressure gradient of 0.7 psi per foot depth (15.9 kPa/m) without leave of the Board. ICG shall support any leave application with an engineering and economic study showing that greater pressures are safe and in the public interest.
5. ICG shall file with the Board a copy of the Operating Agreement for the Oil Springs East Pool upon its execution.
6. ICG shall obtain from the Ministry of the Environment, a Certificate of Approval in accordance with Section 8 of the Environmental Protection Act, R.S.O. 1980, c. 141, regarding the emission of contaminants into the natural environment. A copy of the Certificate of Approval shall be filed with the Board prior to any injection of gas into the Pool.

NOTE: The Ontario Energy Board's designated representative shall be the Project Manager, Engineering.

APPENDIX III

Proposed Conditions of Approval Leave to Construct Facilities - E.B.L.O. 233

- a) Subject to Condition (b), ICG shall comply with all undertakings made by its counsel and witnesses, and shall construct the Transmission Pipelines and compressor station and shall restore the land according to the evidence of its witnesses at this hearing.
- b) ICG shall advise the Board's designated representative of any proposed material change in construction or restoration procedures and, except in an emergency, ICG shall not make such change without prior approval of the Board or its designated representative. In the event of an emergency, the Board shall be informed forthwith after the fact.
- c) ICG shall furnish the Board's designated representative with every reasonable facility for ascertaining whether the work has been, and is being, performed in accordance with the Board's Order.

- d) ICG shall file with the Board's designated representative, notice of the date on which the installed Transmission Pipelines are pressure tested within one month after the test date.
- e) Both during and after the construction, ICG shall monitor the effects upon the land and the environment, and shall file ten copies of a final monitoring report in writing with the Board. The final monitoring report shall be filed within 15 months of the in-service date.
- f) The final monitoring report shall describe the implementation of Conditions (a) and (b), if any, and shall include a description of the effects noted during construction and the actions taken or to be taken to prevent or mitigate the long-term effects of the construction upon the land and the environment. This report shall describe any outstanding concerns of landowners.
- g) The final monitoring report shall describe the condition of the rehabilitated right-of-way. The results of the monitoring programs and analysis shall be included and recommendations made as appropriate. Further, the final report shall include a breakdown of external costs incurred to date for the authorized project, with items of cost associated with particular environmental measures delineated and identified as pre-construction

- related, construction related and restoration related. Any deficiency in compliance with undertakings in paragraph (a) shall be explained.
- h) ICG shall give the Board's designated representative and the Chairman of the Ontario Pipeline Coordinating Committee ("OPCC") 10 days written notice, in advance of the commencement of the construction of the Transmission Pipelines.
 - i) ICG shall file with the Board's designated representative "as-built" drawings of the Transmission Pipelines; such drawings shall indicate any changes in route alignment.
 - j) Within 12 months of the in-service date, ICG shall file with the Board a written Post Construction Financial Report. The Report shall indicate the actual capital costs of the project in the same format as Table 1, as amended, of the Board's Decision herein and shall explain all significant variances from the estimates adduced in the hearing.
 - k) The Leave to Construct granted herein terminates 12 months from any Board order authorizing Leave to Construct.
 - l) ICG shall designate one of its employees as project engineer who will be responsible for the fulfillment of undertakings on the construction site. ICG shall provide the name of the project

engineer to the Board. ICG shall prepare a list of the undertakings given by its witnesses during the hearing and will provide it to the Board for verification and to the project engineer for compliance during construction.

NOTE: The Ontario Energy Board's designated representative shall be the Project Manager, Engineering.

